Center Independent Research & Development: GSFC IRAD

Evaluation of High Pressure Pump On a Chip Technology

Completed Technology Project (2016 - 2017)

Project Introduction

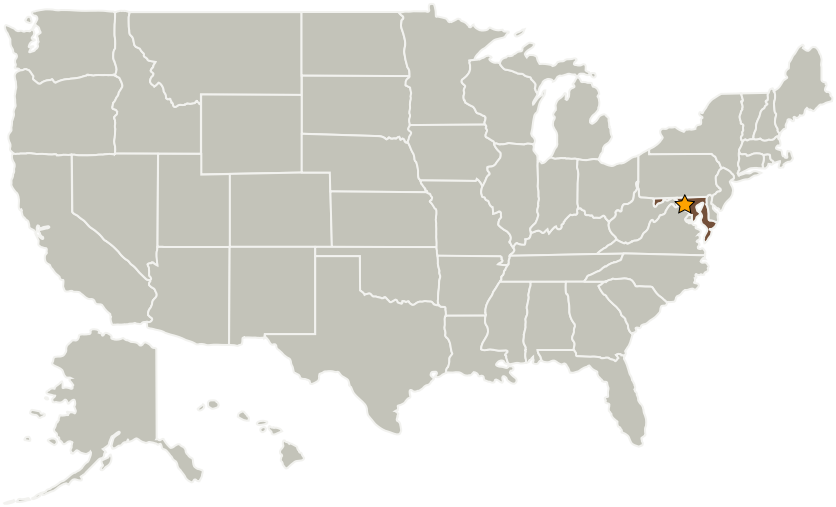
High Pressure Pump On a Chip (HPPOC) Technology was developed by HJ Science & Technology, Inc. under a Phase II STTR project. Both a pump and a micro-valve were developed with the intent to enable compatibility with a spaceflight instrument. This project evaluates the performance of the HPPOC for possible instruments applications.

Both the pump and valve need to be completely characterized to determine their utility in incorporating the technology that utilizes microfluidic components.

Anticipated Benefits

Incorporation of these devices into an instrument would significantly reduce the mass and operating power required as compared to currently available technologies. There should also be a significant increase in reliability over current electromechanical pumps.

Primary U.S. Work Locations and Key Partners



Organizations Performing Work	Role	Type	Location
★Goddard Space Flight Center(GSFC)	Lead Organization	NASA Center	Greenbelt, Maryland

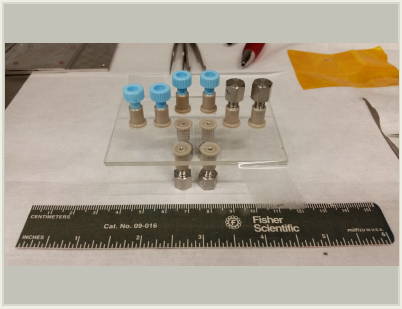


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Table of Contents

Evaluation of High Pressure Pump On a Chip Technology

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Primary U.S. Work Locations
Maryland

Project Transitions

October 2016: Project Start

September 2017: Closed out

Closeout Summary: The purpose of the Goddard Space Flight Center's Internal Research and Development (IRAD) program is to support new technology development and to address scientific challenges. Each year, Principal Investigators (PIs) submit IRAD proposals and compete for funding for their development projects. Goddard's IRAD program supports eight Lines of Business: Astrophysics; Communications and Navigation; Cross-Cutting Technology and Capabilities; Earth Science; Heliophysics; Planetary Science; Science Small Satellites Technology; and Suborbital Platforms and Range Services.Task progress is evaluated twice a year at the Mid-term IRAD review and the end of the year. When the funding period has ended, the PIs compete again for IRAD funding or seek new sources of development and research funding or agree to external partnerships and collaborations. In some cases, when the development work has reached the appropriate Technology Readiness Level (TRL) level, the product is integrated into an actual NASA mission or used to support other government agencies. The technology may also be licensed out to the industry.The completion of a project does not necessarily indicate that the development work has stopped. The work could potentially continue in the future as a follow-on IRAD; or used in collaboration or partnership with Academia, Industry and other Government Agencies.If you are interested in partnering with NASA, see the TechPort Partnerships documentation available on the TechPort Help tab. http://techport.nasa.gov/help

Images

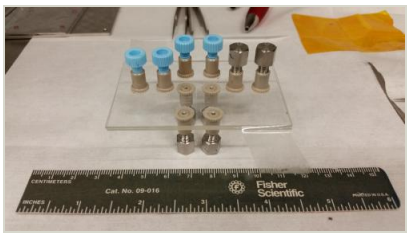
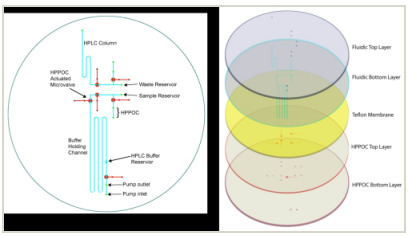


Photo of the Prototype Device

, *(https://techport.nasa.gov/image/26077)*



Schematic of the Prototype Device

Device Schematic *(https://techport.nasa.gov/image/26078)*

Organizational Responsibility

Responsible Mission Directorate:

Mission Support Directorate (MSD)

Lead Center / Facility:

Goddard Space Flight Center (GSFC)

Responsible Program:

Center Independent Research & Development: GSFC IRAD

Project Management

Program Manager:

Peter M Hughes

Project Managers:

Terence A Doiron
Brook Lakew

Principal Investigator:

Carl Kotecki

Co-Investigator:

Jamie E Cook

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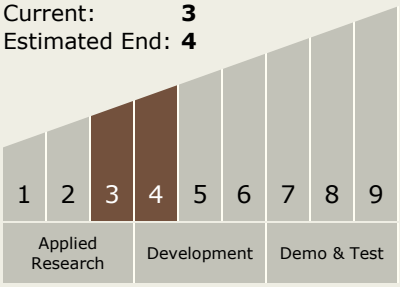
Project Website:

http://aetd.gsfc.nasa.gov/

Technology Maturity (TRL)

Start: **3**
Current: **3**
Estimated End: **4**



Technology Areas

Primary:

- TX08 Sensors and Instruments
  - TX08.1 Remote Sensing Instruments/Sensors
    - TX08.1.1 Detectors and Focal Planes

Target Destinations

The Moon, Mars, Others Inside the Solar System